Claims.

1. A spatial light modulator imaging system comprising: -

at least one electrically addressed spatial light modulator EASLM (4, 30)

an optically addressed spatial light modulator OASLM (6, 8, 31) itself comprising a layer (21) of a nematic liquid crystal material contained between two cell walls (15, 24) provided with parallel in opposite direction alignment, the layer thickness d and the birefringence Δn at a wavelength λ approximately satisfy the equation $\Delta n.d=\lambda/4$;

an optical system (5, 32) for directing light from the EASLM (4, 30) onto the OASLM (6, 8, 31)

a controller (13, 40) for loading images on the EASLM (4, 30) then optically onto the OASLM (6, 8, 31)

a controller (13) for applying write voltages to the OASLM (6, 8, 31) simultaneously with application of addressing light (9, 33);

a read light source (10, 12, 36) providing coherent light of one or more wavelengths for illuminating the OASLM (8, 31) to provide visible diffracted images;

the arrangement being such that a plurality of images are read into the EASLM (4, 30) and thence onto the OASLM (6, 8, 31) at a rate sufficient to present a stable holographic image to an observer (11).

2. A spatial light modulator imaging system comprising: -

at least one electrically addressed spatial light modulator EASLM (4, 30)

a monostable optically addressed spatial light modulator OASLM (6, 8, 31)

arranged to receive addressing light (1, 2, 33) from the EASLM (4, 30) through an optical system (5, 32)

a controller (13, 40) for loading images onto the EASLM (4, 30) then optically onto the OASLM (6, 8, 31)

a controller (13) for applying write voltages to the OASLM (6, 8, 31) simultaneously with application of addressing light (9, 33);

a read light (10, 12, 36) for illuminating the OASLM (8, 31) to provide visible images;

the arrangement being such that a plurality of images are read into the EASLM (4, 30) and thence onto the OASLM (6, 8, 31) at a rate sufficient to present a stable image to an observer (11).

3. The system of claim 2 wherein the read light is coherent light of one or more wavelengths.

4. The system of claim 2 wherein the read light is incoherent light.

5. The system of claim 2 wherein the OASLM comprises a layer of a nematic liquid crystal material.

6 The system of claim 2 wherein the OASLM comprises a layer of a nematic liquid crystal material arranged to give a layer retardation optimised to give maximum diffraction efficiency between switched and unswitched states.

7. The system of claim 2 wherein the OASLM comprises a layer of a nematic liquid crystal material contained between two cell walls provided with parallel in opposite direction alignment.

8. The system of claim 2 wherein the OASLM comprises a layer of a nematic liquid crystal material contained between two cell walls provided with parallel in opposite direction alignment with a surface tilt of less than 10°.

9. The system of claim 2 wherein the OASLM comprises a layer of a nematic liquid crystal material contained between two cell walls provided with parallel in opposite direction alignment, the layer thickness d and the birefringence Δn at a wavelength λ approximately satisfy the equation $\Delta n.d=\lambda/4$.

10. The system of claim 2 wherein the EASLM is a single EASLM whose output is arranged to be scanned sequentially over different areas of the OASLM.

11. The system of claim 2 wherein the OASLM is a single OASLM having a plurality of segments arranged to be addressed in a sequence by light from the EASLM.

12. The system of claim 2 wherein the OASLM is formed by a plurality of single OASLMs arranged to be addressed in a sequence by light from the EASLM.

13. The system of claim 2 wherein the controller contains computer generated holographic images for providing a diffraction pattern to be loaded into the EASLM (4) and displayed to an observer as a three dimensional image.

14. The system of claim 2 wherein the EASLM (30) is an m by n array of separately addressable EASLMs and the OASLM (31) is an m by n array of segments or separate OASLMs.

15. The system of claim 2 wherein the OASLM contains a layer of nematic liquid crystal material arranged in a twisted configuration (90°, 180°, 270°, 360° of twist).